

Listing of Claims:

1. (Currently Amended) A waveguide type optical device characterized by comprising:

a substrate having an electro-optic effect and opposed end faces at ends of the substrate in a longitudinal direction and
5 opposed side faces;

an optical waveguide which is formed ~~upper~~ on the substrate and which includes: [[;]]

a plurality of functional optical waveguides, provided
to the optical waveguide wherein light guided through the
10 functional optical waveguides interacts with an applied electric
signal;

~~at least one of~~ an optical input end face and an optical output end face ~~for the optical waveguide~~ which are provided to at respective ones of the end faces of the substrate
15 ~~end faces which are ends at longitudinal direction sides of the substrate;~~ and

~~at least one of~~ an input optical waveguide connecting the optical input end face and the functional optical waveguides, and an output optical waveguide connecting the optical output end face and the functional optical waveguides[[,]]; ~~wherein and~~
20

at least one of a signal light monomode optical fiber which has an end located opposite to the input optical waveguide at the

optical input end face and which inputs light to the input optical waveguide, and a signal light monomode optical fiber which has an end located opposite to the output optical waveguide at the optical output end face and which receives light output from the output optical waveguide,

wherein ~~the~~ at least one of the input optical waveguide and the output optical waveguide is ~~formed so as~~ arranged to form ~~angles~~ an angle other than 0° with the functional optical waveguides at the at least one of the optical input end face and the optical output end face, ~~waveguide connected thereto such that the at least one of the input optical waveguide and output optical waveguide is not coincident with the functional optical waveguide connected thereto, and~~

wherein the at least one of the input optical waveguide and the output optical waveguide is arranged such that the at least one of the input optical waveguide and the output optical waveguide is not perpendicular to the corresponding one of the substrate end faces, and

wherein the at least one of the input optical waveguide and the output optical waveguide is arranged such that the light input to or output from the at least one signal light monomode optical fiber is inclined at a desired angle with respect to the corresponding side face of the substrate ~~and so as to make angles~~

~~formed to the substrate end faces at the respective sides
different from 90°.~~

Claim 2 (Canceled).

3. (Currently Amended) The waveguide type optical device
according to claim [[1]] 15, ~~characterized by further comprising:
a package case into which the substrate is to be housed,
wherein , in order for an absolute value of angles formed by~~
5 ~~at least one of a light input to the optical input end face and a
light output from the optical output end face, and the substrate
end faces which are the ends at the short-side direction sides of
the substrate or the package case side faces at the short-side
direction sides of the package case to be made smaller than an
absolute value of angles formed by a light input to the optical~~
10 ~~input end face or a light output from the optical output end
face, and the substrate end faces which are the ends at the
short-side direction sides of the substrate or the package case
side faces at the short-side direction sides of the package case~~
15 ~~when it is assumed that at least one of the input optical
waveguide and the output optical waveguide is parallel to the
functional optical waveguides,~~

wherein at least one of the input optical waveguide and the
output optical wave guide is arranged such that angles formed by

20 the at least one of the input optical waveguide and the output optical waveguide with the functional optical ~~waveguides~~ waveguide connected thereto are ~~made~~ different from 0° , and angles formed to the substrate end faces at the respective sides of the substrate are ~~made~~ different from 90° .

4. (Currently Amended) The waveguide type optical device according to claim [[1]] 16, ~~characterized by further comprising:~~
~~a package case into which the substrate is to be housed, in order for a wherein the at least one of the input optical~~
5 waveguide and the output optical wave guide is arranged such that
light input to the optical input end face or ~~a~~ light output from the optical output end face ~~to be~~ is input or output in a direction parallel to the substrate ~~end side~~ side faces ~~which are the ends at the short-side direction sides of the substrate or the~~
10 ~~package case side faces at the short-side direction sides of the package case, angles formed by at least one of the input optical waveguide and the output optical waveguide with the functional optical waveguides are made different from 0° , and angles formed to the substrate end faces at the respective sides are made~~
15 ~~different from 90° .~~

5. (Currently Amended) The waveguide type optical device according to claim 1, ~~characterized in that a~~ wherein the signal

light monomode optical fiber is ~~provided~~ arranged in the a vicinity of one of the optical input end face ~~or and in the~~
5 ~~vicinity of~~ the optical output end face.

6. (Currently Amended) The waveguide type optical device according to claim [[2]] 15, ~~characterized in that given that an equivalent refractive index of the input optical waveguide or the output optical waveguide, or a refractive index of the substrate~~
5 ~~is n_{eff}~~

~~a refractive index or an equivalent refractive index of a medium which the input optical waveguide or the output optical waveguide contacts is n_{eff}~~

wherein the input optical waveguide, the output optical
10 waveguide and the package case are formed such that angles formed by light incident into the input optical waveguide and the package case side faces, or angles formed by light output from the output optical waveguide and the package case side faces are at desired angles θ_{iA} and $(\theta_{oA}-\theta_{iA})$ which are different from 0° ,
15 and

θ_{oA} is an angle formed by the optical input end face or the optical output end face to the perpendicular line with respect to the substrate side faces ~~is θ_{oA}~~ ,

θ_{iA} are angles formed by the input optical waveguide or the output optical waveguide to the substrate side faces ~~are θ_{iA}~~ , and

$\Delta\theta$ are angles formed by a light incident into the input optical waveguide or [[a]] light emitted from the output optical waveguide to the functional optical waveguides are ~~$\Delta\theta$~~ , and when the ~~$\Delta\theta$~~ is given by $\Delta\theta = (\theta_{OA} - \theta_{IA})n_1/n_2$, θ_{OA} , and n_1 is an equivalent refractive index of the input optical waveguide or the output optical waveguide, or a refractive index of the substrate and n_2 is a refractive index or an equivalent refractive index of a medium which the input optical waveguide or the output optical waveguide contacts in order for angles formed by a light incident into the input optical waveguide and the package case side faces, or angles formed by a light output from the output optical waveguide and the package case side faces at the short-side direction sides to be desired angles, the θ_{IA} and the $(\theta_{OA} - \theta_{IA})$ are made different from θ .

7. (Currently Amended) The waveguide type optical device according to claim 3, characterized in that,

given that an equivalent refractive index of the input optical waveguide or the output optical waveguide, or a refractive index of the substrate is n_7 ,

a refractive index or an equivalent refractive index of a medium which the input optical waveguide or the output optical waveguide contacts is n_7

wherein the input optical waveguide, the output optical
10 waveguide and the package case are formed such that θ_{iA} is
different from 0° such that an absolute value of $\Delta\theta$ is smaller
than an absolute value of $\Delta\theta$ when θ_{iA} is 0° , and

θ_{oA} is an angle formed by the optical input end face or the
optical output end face to the perpendicular line with respect to
15 the substrate side faces ~~is θ_{π} ,~~

θ_{iA} are angles formed by the input optical waveguide or the
output optical waveguide to the substrate side faces ~~are θ_{π} ,~~ and

$\Delta\theta$ are angles formed by a light incident into the input
optical waveguide or a light emitted from the output optical
20 waveguide to the functional optical waveguides ~~are $\Delta\theta$, and when~~
~~the $\Delta\theta$ is given by the $\Delta\theta$ is given by $\Delta\theta = (\theta_{oA} - \theta_{iA})n_1/n_2$ θ_{oA} , and~~
 n_1 is an equivalent refractive index of the input optical
waveguide or the output optical waveguide, or a refractive index
of the substrate and n_2 is a refractive index or an equivalent
25 refractive index of a medium which the input optical waveguide or
the output optical waveguide contacts

~~in order for an absolute value of the $\Delta\theta$ to be smaller than~~
~~an absolute value of the $\Delta\theta$ in a case where a value of the θ_{π} is~~
~~made to be 0 , the θ_{π} is made different from 0 .~~

8. (Currently Amended) The waveguide type optical device
according to claim 4, ~~characterized in that,~~

given that an equivalent refractive index of the input
optical waveguide or the output optical waveguide, or a
5 refractive index of the substrate is n_2 ,

a refractive index or an equivalent refractive index of a
medium which the input optical waveguide or the output optical
waveguide contacts is n_2 ,

10 wherein the input optical waveguide, the output optical
waveguide and the package case are formed such that n_1 , n_2 , θ_{0A}
and θ_{1A} satisfy a relationship of $\theta_{0A} = n_1 \theta_{1A} / (n_1 - n_2)$, or n_1 , n_2 , θ_{0B}
and θ_{1B} satisfy a relationship of $\theta_{0B} = n_1 \theta_{1B} / (n_1 - n_2)$, and

θ_{0A} is an angle formed by the optical input end face or the
optical output end face to the perpendicular line with respect to
15 the substrate side faces ~~is θ_{0A}~~ ,

θ_{0B} is an angle formed by the optical input end face or the
optical output end face to the perpendicular line with respect to
the package case side faces ~~is θ_{0B}~~ ,

θ_{1A} are angles formed by the input optical waveguide or the
20 output optical waveguide to the substrate side faces ~~are θ_{1A}~~ , and

θ_{1B} are angles formed by the input optical waveguide or the
output optical waveguide to the package case side faces ~~are θ_{1B}~~ ,
and n_1 is an equivalent refractive index of the input optical
waveguide or the output optical waveguide, or a refractive index
25 of the substrate and n_2 is a refractive index or an equivalent
refractive index of a medium which the input optical waveguide or

the output optical waveguide contacts ~~the n_{1r} , the n_{2r} , the θ_{cr} , and the θ_{1r}~~ satisfy a relationship of $\theta_{cr} = n_r \theta_{1r} / (n_1 - n_2)$, or the n_{1r} , the n_{2r} , the θ_{cr} , and the θ_{1r} satisfy a relationship of $\theta_{cr} = n_r \theta_{1r} / (n_1 - n_2)$.

9. (Currently Amended) The waveguide type optical device according to claim [[2]] 3, ~~characterized in that, in order for wherein the at least one of the input optical waveguide and the output optical wave guide is arranged such that~~ an absolute value of angles formed by at least one of [[a]] light input to the optical input end face and [[a]] light output from the optical output end face, and the substrate ~~end side faces which are the ends at the short-side direction sides of the substrate or the package case side faces at the short-side direction sides of the package case to be made~~ are smaller than an absolute value of angles formed by [[a]] light input to the optical input end face or [[a]] light output from the optical output end face, and the substrate ~~end side faces which are the ends at the short-side direction sides of the substrate or the package case side faces at the short-side direction sides of the package case when it is assumed that~~ when at least one of the input optical waveguide and the output optical waveguide is parallel to the functional optical waveguides, ~~angles formed by at least one of the input optical waveguide and the output optical waveguide with the~~

20 ~~functional optical waveguides are made different from 0°, and angles formed to the substrate end faces at the respective sides are made different from 90°.~~

10. (Currently Amended) The waveguide type optical device according to claim [[2]] 15, ~~characterized in that, in order for~~
~~a wherein the at least one of the input optical waveguide and the~~
~~output optical wave guide is arranged such that~~ light input to
5 the optical input end face or [[a]] light output from the optical output end face ~~to be~~ is input or output in a direction parallel to the substrate ~~end side~~ faces ~~which are the ends at the~~
~~short-side direction sides of the substrate or the package case~~
~~side faces at the short-side direction sides of the package case,~~
10 ~~angles formed by at least one of the input optical waveguide and the output optical waveguide with the functional optical~~
~~waveguides are made different from 0°, and angles formed to the~~
~~substrate end faces at the respective sides are made different~~
~~from 90°.~~

11. (Currently Amended) The waveguide type optical device according to claim 3, ~~characterized in that, in order for a~~
~~wherein the at least one of the input optical waveguide and the~~
~~output optical wave guide is arranged such that~~ light input to
5 the optical input end face or a light output from the optical

output end face ~~to be~~ is input or output in a direction parallel to the substrate ~~end~~ side faces ~~which are the ends at the short-side direction sides of the substrate or the package case side faces at the short-side direction sides of the package case,~~

10 angles formed by at least one of the input optical waveguide and the output optical waveguide with the functional optical waveguides ~~are made different from 0° , and angles formed to the substrate end faces at the respective sides are made different from 90° .~~

12. (Currently Amended) The waveguide type optical device according to claim [[2]] 15, ~~characterized in that a wherein the signal light~~ monomode optical fiber is ~~provided arranged in the a~~ vicinity of one of the optical input end face ~~or in the vicinity of and~~ the optical output end face.

13. (Currently Amended) The waveguide type optical device according to claim 3, ~~characterized in that a wherein the signal light~~ monomode optical fiber is ~~provided arranged in the a~~ vicinity of one of the optical input end face ~~or in the vicinity of and~~ the optical output end face.

14. (Currently Amended) The waveguide type optical device according to claim 4, ~~characterized in that a wherein the signal~~

light monomode optical fiber is ~~provided~~ arranged in ~~the~~ a
vicinity of one of the optical input end face ~~or in the vicinity~~
5 ~~of and~~ the optical output end face.

15. (New) A waveguide type optical device comprising:

a substrate having an electro-optic effect and opposed end
faces at ends of the substrate in a longitudinal direction and
opposed side faces;

5 an optical waveguide which is formed on the substrate and
which includes:

a plurality of functional optical waveguides, wherein
light guided through the functional optical waveguides interacts
with an applied electric signal;

10 an optical input end face and an optical output end
face which are provided at respective ones of the end faces of
the substrate; and

an input optical waveguide connecting the optical input
end face and the functional optical waveguides, and an output
15 optical waveguide connecting the optical output end face and the
functional optical waveguides;

at least one of a signal light monomode optical fiber which
has an end located opposite to the input optical waveguide at the
optical input end face and which inputs light to the input
20 optical waveguide, and a signal light monomode optical fiber

which has an end located opposite to the output optical waveguide at the optical output end face and which receives light output from the output optical waveguide; and

25 a package case in which the substrate is housed and having opposed side faces,

wherein at least one of the input optical waveguide and the output optical waveguide is arranged to form an angle other than 0° with the functional optical waveguide connected thereto such that the at least one of the input optical waveguide and output
30 optical waveguide is not coincident with the functional optical waveguide connected thereto, and

wherein the at least one of the input optical waveguide and the output optical waveguide is arranged such that the at least one of the input optical waveguide and the output optical
35 waveguide is not perpendicular to the corresponding one of the substrate end faces, and

wherein the at least one of the input optical waveguide and the output optical waveguide is arranged such that the light input to or output from the at least one signal light monomode
40 optical fiber is inclined at a desired angle with respect to at least one of the side face of the substrate and the side face of the package case.

16. (New) The waveguide type optical device according to claim 3, wherein the at least one of the input optical waveguide and the output optical wave guide is arranged such that an absolute value of angles formed by light input to the optical input end face and light output from the optical output end face, and the substrate said faces or the package case side faces is smaller than an absolute value of angles formed by light input to the optical input end face or light output from the optical output end face, and the substrate side faces or the package case side faces when the at least one of the input optical waveguide and the output optical waveguide is parallel to the functional optical waveguide connected thereto.

17. (New) The waveguide type optical device according to claim 1, wherein the at least one of the input optical waveguide and the output optical waveguide is arranged such that the light input to or output from the signal light monomode optical fiber is input in a direction parallel to the side faces of the substrate.

18. (New) The waveguide type optical device according to claim 15, wherein the at least one of the input optical waveguide and the output optical waveguide is arranged such that the light input to or output from the signal light monomode optical fiber

5 is input in a direction parallel to the side faces of the substrate or to the side faces of the package case.

19. (New) The waveguide type optical device according to claim 1, wherein the signal light monomode optical fiber is attached to one of the side faces of the substrate such that the signal light monomode optical fiber has a portion adjoining the
5 attached side face which is parallel to the side faces of the substrate.

20. (New) The waveguide type optical device according to claim 15, wherein the signal light monomode optical fiber is attached to one of the side faces of the substrate such that the signal light monomode optical fiber has a portion adjoining the
5 attached side face which is parallel to the at least one of the side faces of the substrate and the side faces of the package case.

21. (New) The waveguide type optical device according to claim 1, wherein both the input optical waveguide and the output optical waveguide are arranged to form an angle other than 0° with the functional optical waveguides connected thereto such
5 that the input optical waveguide and output optical waveguide are

not coincident with the functional optical waveguides connected thereto.

22. (New) The waveguide type optical device according to claim 15, wherein both the input optical waveguide and the output optical waveguide are arranged to form an angle other than 0° with the functional optical waveguides connected thereto such
5 that the input optical waveguide and output optical waveguide are not coincident with the functional optical waveguides connected thereto.